

Name: _____

Math 105

Quiz #4

September 30, 2013

- This is a closed-book quiz. No books, notes, calculators, cell phones, communication devices of any sort, or webpages, or other aids are permitted.
- Please *show* all of your work and *justify* all of your answers.

1. [10 Points] Consider the function defined by

$$f(x) = \begin{cases} \frac{1}{x-2} & \text{if } x > 2 \\ 4 - x^2 & \text{if } 0 \leq x < 2 \\ x + 4 & \text{if } -6 < x < 0 \\ 1 - (x + 6)^2 & \text{if } x \leq -6 \end{cases}$$

Graph $f(x)$.

Answer the following questions. Justify your answers.

(a) $\lim_{x \rightarrow -6} f(x) =$

(b) $\lim_{x \rightarrow 0} f(x) =$

(c) $\lim_{x \rightarrow 2} f(x) =$

2. [10 Points] Compute each of the following limits. Justify your answers. Be clear if the limit equals a value, $+\infty$, $-\infty$, or Does Not Exist.

(a) $\lim_{x \rightarrow 7} \frac{3-x}{x-7}$

(b) $\lim_{x \rightarrow -7} \frac{x+7}{x^2+x+1}$

(c) $\lim_{x \rightarrow -7} \frac{x+7}{x^2+2x-35}$

(d) $\lim_{x \rightarrow 2} \frac{\sqrt{x+7}-3}{x^2-3x+2}$

(e) $\lim_{x \rightarrow -7} \frac{\frac{1}{1-x} - \frac{1}{8}}{x+7}$

(f) $\lim_{x \rightarrow 7} \frac{x-7}{|x-7|}$